

**Translation**

**PATENT COOPERATION TREATY**

**PCT**

**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>PC-9031</b>	<b>FOR FURTHER ACTION</b>	See Form PCT/IPEA/416
International application No. <b>PCT/EP2004/000251</b>	International filing date (day/month/year)	Priority date (day/month/year) <b>19.01.2003</b>
International Patent Classification (IPC) or national classification and IPC <b>F02M 37/08</b>		
Applicant <b>MITSUBA CORPORATION</b>		

1.	This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.	
2.	This REPORT consists of a total of <u>9</u> sheets, including this cover sheet.	
3.	This report is also accompanied by ANNEXES, comprising: a. <input checked="" type="checkbox"/> (sent to the applicant and to the International Bureau) a total of <u>6</u> sheets, as follows: <input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions). <input checked="" type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box. b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s))  _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).	
4.	This report contains indications relating to the following items: <input checked="" type="checkbox"/> Box No. I Basis of the report <input type="checkbox"/> Box No. II Priority <input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability <input type="checkbox"/> Box No. IV Lack of unity of invention <input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement <input type="checkbox"/> Box No. VI Certain documents cited <input checked="" type="checkbox"/> Box No. VII Certain defects in the international application <input type="checkbox"/> Box No. VIII Certain observations on the international application	

Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/	Authorized officer
Facsimile No.	Telephone No.

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/EP2004/000251

Box No. I

Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of:
- ☐ international search (Rule 12.3 and 23.1(b))
- ☐ publication of the international application (Rule 12.4)
- ☐ international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:
- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 1-15 \_\_\_\_\_ as originally filed/furnished
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the claims:
- nos. \_\_\_\_\_ as originally filed/furnished
- nos.\* \_\_\_\_\_ as amended (together with any statement) under Article 19
- nos.\* 1-22 \_\_\_\_\_ received by this Authority on 29.07.2004 with the letter of 19.07.2004
- nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the drawings:
- sheets 1/4-4/4 \_\_\_\_\_ as originally filed/furnished
- sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_
4. ☒ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages \_\_\_\_\_
- ☒ the claims, nos. 1, 18 \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/EP2004/000251

**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. Statement**

1-17	Novelty (N)	Claims	1-17, 19, 20	YES
		Claims	18, 21, 22	NO
	Inventive step (IS)	Claims	1-17	YES
		Claims	18-22	NO
	Industrial applicability (IA)	Claims	1-22	YES
		Claims		NO

**2. Citations and explanations (Rule 70.7)****1. Reference is made to the following documents:**

D1: US 5 459 330 A  
D2: US 4 725 139 A  
D3: US 2003/011760 A1  
D4: US 2002/135758 A1.

**2. Method claims**

Document D1 discloses an optical method for inspecting a transparent sheet of glass to detect defective points, said sheet of glass being illuminated with light with a wavelength of 633 nm (HeNe laser), the irradiated light penetrating the sheet of glass, back-scattered light at the defective points being sensed by a camera, and the defective points being identified from a local increase in intensity of the light sensed by the camera in the region of the defective points (see column 2, line 50 to column 3, line 3; figure 3).

The method according to independent claim 1 differs therefrom in that:

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Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

- a) the object is to identify defective points within and underneath a transparent protective layer, the transparent protective layer at least partially covering a surface which has coloured patterns;
- b) the irradiated light is in the short-wave visible range.

The subject matter of claim 1 is therefore novel (PCT Article 33(2)).

The problem addressed by the present invention can therefore be regarded as that of:

- a) developing a method for the detection of defective points within and underneath a transparent protective layer applied to a surface which has coloured patterns;
- b) modifying the method known from D1 in such a way that defects close to the surface can be identified with a greater degree of precision.

Document D2 describes an optical method for the detection of defects on the surface of, and within, a transparent sheet of glass, the wavelength of the irradiated light being in the spectral region from UV to IR, the choice of wavelength in each case being based on the desired depth of penetration, mention being

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Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

made in particular of the transition region between UV and visible light (see column 3, lines 27-55).

Feature b) is therefore rendered obvious by D1 in combination with D2.

Neither D1 nor D2 discloses or renders obvious the application of the methods described in each of said documents to the inspection of a transparent protective layer applied to a surface which has coloured patterns (feature a)).

The subject matter of claim 1 and of its dependent claims, claims 2-17, is therefore considered to be inventive (PCT Article 33(3)).

### 3. Device claims

Document D3 discloses a device (see figure 3) that is suitable for the optical inspection of a surface which has coloured patterns, said device having:

a first light source, with an emission spectrum that includes short-wave visible light (see paragraph [0043]: argon laser); and

a sensor associated with said first light source, the sensor being suitable for sensing scattered light at defective points within the protective layer, the defective points being

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Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

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identifiable from a local increase in the light sensed by the imaging sensor in the region of the defective points (see paragraphs [0056], [0058] and [0061]).

The subject matter of claim 18 consequently lacks novelty (PCT Article 33(2)).

D3 also anticipates the subject matter of claims 21 and 22 (see paragraph [0054]; figure 3).

The subject matter of claim 19 is rendered obvious by D3 in combination with D4 (see paragraphs [0009], [0192], [0217], [0218]).

The subject matter of claim 20 is considered to be within the scope of normal practice in the art.

**Box No. VII      Certain defects in the international application**

The following defects in the form or contents of the international application have been noted:

1.      Contrary to PCT Rule 5.1(a)(ii), the description does not cite documents D1 to D4 or indicate the relevant prior art disclosed therein.
  
2.      Contrary to PCT Rule 11.13(m), the reflex channel is indicated with reference sign 22 in figures 1 and 2 but with reference sign 32 in figure 6a, reference sign 32 being used again in figure 3 for the light beam emitted from light source 24.

The reference sign 54 used in figure 5 does not appear in the description (PCT Rule 11.13(1)).

## Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

Box I

The amendments submitted to the International Bureau in accordance with PCT Article 19(1) introduce substantive matter which, contrary to PCT Article 19(2), goes beyond the disclosure in the international application as filed. The amendments are as follows:

Independent method claim 1:

Replacement of the original wording:

*"the first light source (40) emitting light in the short wavelength visible range"*

by the following words:

*"the first light source (40) emitting short-wave light in the range that is visible to the imaging sensor (42)".*

Independent method claim 18:

Replacement of the original wording:

*"which comprises a first light source (40), with an emission spectrum that includes short-wave visible light",*

by the following words:

*"the emission spectrum of the first light source (40) includes short-wave light in the range that is visible to the imaging sensor (42)".*



## Supplemental Box

The new wording, in each case, extends the scope of protection of the respective claim since the emitted wavelength is defined only relative to an imaging sensor that is not more precisely specified and, in consequence, comprises all the wavelength ranges for which there are corresponding sensors (for example, also comprising UV and infrared, etc.).

According to the description, only light in the short-wave visible spectral range is used for the detection of defective points in the protective layer ("scattering centres") (see page 4, line 18; page 4, lines 24-26; page 6, lines 22-23; page 10, line 29 to page 11, line 1).

Figures 5 and 6b show the characteristic curves of a light source that emits in the range between 300 and 370 nm; however, the portion emitted in the UV-range acts only to excite fluorescence in the transparent protective layer.

The portion emitted in the short-wave visible range is used for the detection of scattering defects; this is also evident from the fact that the range visible to the camera begins only at circa 350 nm.

In consequence, for the purpose of the following assessment in respect of novelty and inventive step, the aforementioned amendments have been disregarded.